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EXAMINER

MCNELIS, KATHLEEN A

ART UNIT	PAPER NUMBER
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1742

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/647,022	Applicant(s) LI ET AL.	
	Examiner Kathleen A. McNelis	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/20/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claims Status

Claims 1-5 and 7-34 remain for examination wherein claims 1-3, 7-11, 13-17 and 23 are amended, 18-23 are withdrawn, and 24-34 are new.

Election/Restrictions

Applicant's traversal of the election by original presentation filed on 12/20/2006 is acknowledged. The traversal is on the ground(s) that claim 23 is essentially the same as claim 3, and further are classified in the same class if different subclasses, and the additional search would therefore not be overly burdensome. This is not found persuasive because in claim 3 a polymeric foam is impregnated with metal particles, dried and sintered. In claim 23 a sintered porous metal article is coated with metal particles, dried and sintered. As discussed in the restriction requirement on p. 3 of the 08/21/2006 Office action, these have acquired a separate status in the art and are classified in different subclasses.

The requirement is still deemed proper and is therefore made FINAL.

Status of Previous Rejections and Objections

The following rejections/objections are withdrawn in view of amendments to the claims:

- The objection to claims 9-17 under 37 CFR 1.75(c) as being in improper form because a multiple dependencies is withdrawn in view of amendments to the claims,
- Claims 1, 2, 7 and 8 under 35 U.S.C. 103(a) as being unpatentable over WO 97/31738 (WO '738) in view of Duperray et al. (U.S. Pat. No. 4,569,821) and Eber et al.¹ (U.S. Pat. No. 2,686,958),

¹ The first named inventor on U.S. Pat. No. 2,686,958 is M. Eber, and the face of the patent recites M. Eber et al. However, this patent is identified by USPTO software and on the Notice of References Cited by the second named inventor, William J. Knochel.

- Claims 1 and 2 under 35 U.S.C. 103(a) as being unpatentable over GB 1,004,352 (GB '352) in view of Eber et al. (U.S. Pat. No. 2,686,958) and Duperray et al. (U.S. Pat. No. 4,569,821),
- Claims 1, 2, 3, 4 and 7 under 35 U.S.C. 103(a) as being unpatentable over Haack et al. (U.S. Pat. No. 6,706,239) in view of Eber et al. (U.S. Pat. No. 2,686,958) and Duperray et al. (U.S. Pat. No. 4,569,821),
- Claim 5 under 35 U.S.C. 103(a) as being unpatentable over Haack et al. (U.S. Pat. No. 6,706,239) in view of Eber et al. (U.S. Pat. No. 2,686,958) and Duperray et al. (U.S. Pat. No. 4,569,821) as applied to claims 3 and 4 and further in view of WO 97/31738 (WO '738), and
- Claim 5 under 35 U.S.C. 103(a) as being unpatentable over Haack et al. (U.S. Pat. No. 6,706,239) in view of Eber et al. (U.S. Pat. No. 2,686,958) and Duperray et al. (U.S. Pat. No. 4,569,821) as applied to claims 3 and 4 and further in view of WO 83/00282 (WO '282).

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-5, 7-11, 14-16, 24-28 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (U.S. Pat. No. 6,296,667) in view of Duperray et al. (U.S. Pat. No. 4,569,821) and Eber et al. (U.S. Pat. No. 2,686,958).

With respect to claims 1-5, 7, 8, 10, 11, 24, 25, 27 and 28, Johnson et al. discloses a method for forming a strong porous article either as a coating on a strong framework of between framework struts for use as a bone substitute material (abstract), by forming metal or ceramic (col. 4 lines 60- col. 5 line 6) where metals include titanium, stainless steels, cobalt/chrome alloys, tantalum and titanium nickel alloys (col. 5 lines 57-60) as in claims 4, 5, 7, 8, 24 and 25.

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Examiner contends that a bone substitute material is an implant. In a preferred forming method, the ceramic (col. 5 lines 5-55) or metal (col. 5 line 57-13) powder is mixed with a binder (as in claims 11 and 28) and water to form a slurry. A form of polyurethane (as in claims 10 and 27) or the like foam is wetted and coated in the slurry. Once coated, the form (strut) is dried, heated to pyrolyze or burn away the organic material; and then sintered (col. 5 lines 5-55).

Johnson et al. does not teach placing metal hydride particles in a different location in the pyrolysis environment.

Duperray et al. discloses a method for forming a porous metal body by preparing a foam, incorporating metal powder to form a suspension then heating to pyrolyze the organic material and sinter the metal (abstract). The foam is polymeric, preferably belonging to the polyurethane family (col. 2 lines 1-56). Duperray et al. teaches that the resulting gas from pyrolysis must be evacuated or trapped when polyurethane is used since the gas will include free cyanohydric acid (col. 3 lines 27-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to trap the gases as taught by Duperray et al. from the process of Johnson et al. since Johnson et al. discloses pyrolysis of polyurethane and Duperray et al. teaches that when polyurethane is pyrolyzed the gases contain free cyanohydric acid and must be evacuated or trapped.

Eber et al. discloses a method of coating and bonding (title) using a combination of gettering agent and pump (col. 3 lines 1-8). The gettering agent is used during coating (metallization) of a non-metal (ceramic) and the gettering agent is a metal hydride powder suspended in a suitable vehicle and binder that is painted onto the interior of the vacuum chamber (col. 2 line 31-col. 3 line 55). The interior surface of the vacuum chamber is a different location than the impregnated foam occupies in the furnace. It would have been obvious to one of ordinary

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skill in the art at the time the invention was made to use a metal hydride gettering agent as taught by Eber et al. in the process of Johnson et al. since Eber et al. teaches that it provides a better vacuum while coating and Duperray et al. teaches that the gas from pyrolysis must be evacuated or trapped when polyurethane is used.

With respect to claims 9 and 26, Eber et al. discloses that suitable hydrides include titanium and tantalum (col. 6 lines 28-40), which contain two of the same metals disclosed by Johnson et al. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use titanium hydride as taught by Eber et al. with titanium metal as taught by Johnson et al. since Eber et al. teaches equal utility for hydrides of Zr, Ti, Ta, Nb, V and Th. Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use tantalum hydride as taught by Eber et al. with tantalum metal as taught by Johnson et al. since Eber et al. teaches equal utility for hydrides of Zr, Ti, Ta, Nb, V and Th.

With respect to claims 14, 15, 31 and 32, Duperray et al. teaches that the resulting gas from pyrolysis must be evacuated or trapped when polyurethane is used since the gas will include free cyanohydric acid (col. 3 lines 27-32). The selection of suitable evacuation vacuum would be a matter of routine investigation and optimization for one of ordinary skill in the art. Further, Eber et al. discloses an example pressure of 1.25×10^{-5} mm Hg (i.e. about 1.66×10^{-5} mbars) (col. 6 lines 66-75) which is within the claimed range of 10^{-6} to 10^{-4} mbars.

With respect to claims 16 and 33, Johnson et al. discloses that the pyrolyzing temperature is in the range of 200 to about 600 °C (col. 5 lines 40-41) which overlaps the claimed range of 150 to 550 °C. It would have been obvious to one of ordinary skill in the art at the time the invention was made to pyrolyze at a temperature of between 200 and 550 °C, since Johnson et al. discloses that most organics pyrolyze at between 200 to about 600 °C.

Claims 12 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (U.S. Pat. No. 6,296,667) in view of Duperray et al. (U.S. Pat. No. 4,569,821) and Eber et al. (U.S. Pat. No. 2,686,958) as applied to claims 1, 3 and 11 and further in view of Haack et al. (U.S. Pat. No. 6,706,239) and Dow Chemical product data for Methocel™.

Johnson et al. in view of Duperray et al. and Eber et al. is applied as discussed above regarding claims 1, 3 and 11.

Johnson et al. in view of Duperray et al. and Eber et al. does not disclose using a binder selected from PEG4000, methylcellulose, and/or carboxyl methyl cellulose (CMC).

Haack et al. discloses a method of co-forming a metal article comprising a metal foam on the inside or outside surface of a metal tube or plate. A polymeric foam is coated with a metal powder, placed in contact with a powdered metal component and heat treated to volatilize polymeric foam and solidify the component (abstract). The preferred polymeric foams are polyurethane (col. 4 lines 10-18). The metal powder is mixed with a binder and liquid (col. 3 line 67 – col. 4 line 5) to form a slurry, which is impregnated into the polymeric foam (col. 4 lines 18-30). The composite is dried prior to heat treatment (col. 5 lines 7-10) then heat treated in a controlled atmosphere or vacuum furnace to volatilize the polymeric foam and any organics or binders (i.e. pyrolysis) and to solidify the powdered metal component into a solid part (i.e. sintering) (col. 5 lines 1-35). Haack et al. teaches that suitable binders include methylcellulose (col. 3 lines 48-55) and provides an example where Methocel™ from Dow chemical is used (col. 6 lines 10-26). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a methylcellulose binder as taught by Haack et al. in the manufacture of articles by Johnson et al. in view of Duperray et al. and Eber et al. since Johnson et al. teaches that

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binders are desired and Haack et al. teaches that methylcellulose is suitable for a substantially similar application.

Claims 13 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (U.S. Pat. No. 6,296,667) in view of Duperray et al. (U.S. Pat. No. 4,569,821) and Eber et al. (U.S. Pat. No. 2,686,958) as applied to claims 1 and 3, and further in view of Haack et al. (U.S. Pat. No. 6,706,239) or Pillar (U.S. Pat. No. 4,206,516).

Johnson et al. in view of Duperray et al. and Eber et al. is applied as discussed above regarding claims 1 and 3.

Johnson et al. in view of Duperray et al. and Eber et al. does not disclose a mean particle diameter of 5-100 μm .

Haack et al. discloses a method of co-forming a metal article comprising a metal foam on the inside or outside surface of a metal tube or plate. A polymeric foam is coated with a metal powder, placed in contact with a powdered metal component and heat treated to volatilize polymeric foam and solidify the component (abstract). The preferred polymeric foams are polyurethane (col. 4 lines 10-18). The metal powder is mixed with a binder and liquid (col. 3 line 67 – col. 4 line 5) to form a slurry, which is impregnated into the polymeric foam (col. 4 lines 18-30). The composite is dried prior to heat treatment (col. 5 lines 7-10) then heat treated in a controlled atmosphere or vacuum furnace to volatilize the polymeric foam and any organics or binders (i.e. pyrolysis) and to solidify the powdered metal component into a solid part (i.e. sintering) (col. 5 lines 1-35). Haack et al. discloses an example using stainless steel powders of – 325 mesh (col. 6 lines 10-29) (i.e. less than 45 microns). The range of less than 45 microns overlaps the claimed range of average 5-100 μm , therefore a prima facie case of obviousness exists. It would have been obvious to one of ordinary skill in the art at the time the invention was made to

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use an mean powder size of 4-45 microns, since Haack et al. discloses equal utility for any size less than 45 microns. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use powders of mean size from 5 to 45 microns as taught by Haack et al. in the articles of Johnson et al. in view of Duperray et al. and Eber et al. since Haack et al. discloses the use of this size powder in a substantially similar process.

Pillar discloses production of a surgical prosthetic device or implant where metal particles are used to form a strong adherent coating for ingrowth of fibrous tissue (abstract). Pillar et al. teaches that the size of the particles is chose to ensure that resulting intersitital pore size is at least sufficient to permit bone tissue growth in the porous coating (col. 1 lines 58-67) and provides an example where powder size is -100 to + 325 mesh (i.e. about 45 to 150 microns) (col. 2 lines 36-44). Selection of particle size is therefore a result effective variable and a matter of routine investigation for optimization by one of ordinary skill in the art (see M.P.E.P 2144.05, II, B). Further, the range of about 45 to 150 microns overlaps the claimed range of mean particle diameter of 5-100 μm . It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a mean particle size of between 45 and 100 microns, since Pillar discloses equal utility for a size range of about 45 to 150 microns.

Claims 17 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (U.S. Pat. No. 6,296,667) in view of Duperray et al. (U.S. Pat. No. 4,569,821) and Eber et al. (U.S. Pat. No. 2,686,958) as applied to claims 1-3 and further in view of WO 97/31738 (WO '738).

Johnson et al. in view of Duperray et al. and Eber et al. is applied as discussed above regarding claims 1-3.

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Johnson et al. in view of Duperray et al. and Eber et al. does not disclose sintering at 1050-1350 °C.

WO '738 discloses a method for preparing a porous metal body by coating a reticulated interconnected web precursor with a slurry containing binder and metal (p. 5 lines 25-35). The precursor is an organic material which is burned off and the resulting metal decarburized and sintered in a partial pressure atmosphere or reactive gas (i.e. pyrolysis; abstract). The formed products are suitable for biomaterial applications (p. 20 lines 6-12). In Example 5, WO '738 discloses impregnation with titanium powder and binder slurry wherein the selected foam is impregnated with the titanium slurry, then cured (i.e. dried) at 250 to 350 °F then heated in a vacuum to decarburize (i.e. pyrolyzed) followed by sintering at 2200-2700 °F (p. 14 line 15 – p. 16 line 16) (i.e. about 1204 – 1482 °C). It would have been obvious to one of ordinary skill in the art at the time the invention was made to sinter between 1204 – 1482 °C as taught by WO '738 the titanium articles produced by Johnson et al. in view of Duperray et al. and Eber et al. since WO '738 discloses production of similar articles of the same material by a substantially similar process. Further, the range of 1204 – 1482 °C overlaps the claimed range of 1050-1350 °C therefore a prima facie case of obviousness exists. It would have been obvious to one of ordinary skill in the art at the time the invention was made to sinter Ti articles at between 1204 – 1350 °C since WO '738 discloses equal utility over the range of 1204 – 1482 °C.

Claims 1-5, 7-12, 16, 24-29, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (U.S. Pat. No. 6,296,667) in view of Haack et al. (U.S. Pat. No. 6,706,239), MacGregor (U.S. Pat. No. 4,355,426) and Eber et al. (U.S. Pat. No. 2,686,958).

With respect to claims 1-5, 7, 8, 10, 11, 24, 25, 27 and 28, Johnson et al. discloses a method for forming a strong porous article either as a coating on a strong framework of between

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framework struts for use as a bone substitute material (abstract), by forming metal or ceramic (col. 4 lines 60- col. 5 line 6) where metals include titanium, stainless steels, cobalt/chrome alloys, tantalum and titanium nickel alloys (col. 5 lines 57-60) as in claims 4, 5, 7, 8, 24 and 25.

Examiner contends that a bone substitute material is an implant. In a preferred forming method, the ceramic (col. 5 lines 5-55) or metal (col. 5 line 57-13) powder is mixed with a binder (as in claims 11 and 28) and water to form a slurry. A form of polyurethane (as in claims 10 and 27) or the like foam is wetted and coated in the slurry. Once coated, the form (strut) is dried, heated to pyrolyze or burn away the organic material; and then sintered (col. 5 lines 5-55).

Johnson et al. does not teach placing metal hydride particles in a different location in the pyrolysis environment.

Haack et al. discloses a method of co-forming a metal article comprising a metal foam on the inside or outside surface of a metal tube or plate. A polymeric foam is coated with a metal powder, placed in contact with a powdered metal component and heat treated to volatilize polymeric foam and solidify the component (abstract). The preferred polymeric foams are polyurethane (col. 4 lines 10-18). The metal powder is mixed with a binder and liquid (col. 3 line 67 – col. 4 line 5) to form a slurry, which is impregnated into the polymeric foam (col. 4 lines 18-30). The composite is dried prior to heat treatment (col. 5 lines 7-10) then heat treated in a controlled atmosphere or vacuum furnace to volatilize the polymeric foam and any organics or binders (i.e. pyrolysis) and to solidify the powdered metal component into a solid part (i.e. sintering) (col. 5 lines 1-35). Haack et al. discloses an example using stainless steel powders of – 325 mesh (col. 6 lines 10-29) (i.e. less than 45 microns). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use powders of less than 45 microns

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as taught by Haack et al. in the articles of Johnson et al., since Haack et al. discloses the use of this size powder in a substantially similar process.

MacGregor discloses a method of making a prosthetic device (abstract) where powder of – 325 mesh is used to form a coating (col. 6 lines 57-63) in a sintering process (col. 8 lines 39-44). MacGregor teaches that certain metals including titanium are pyrophoric at small sizes and therefore uses the hydrides of these metals in place of the metal for forming titanium coatings (col. 10 lines 24-36). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use hydrides as taught by MacGregor in producing metal coatings by Johnson et al. in view of Haack et al. since MacGregor teaches that small metal powders such as titanium metal are pyrophoric in the size ranges desired in Johnson et al. in view of Haack et al.

Eber et al. discloses a method of coating and bonding (title) using a combination of gettering agent and pump (col. 3 lines 1-8). The gettering agent is used during coating (metallization) of a non-metal (ceramic) and the gettering agent is a metal hydride powder suspended in a suitable vehicle and binder that is painted onto the interior of the vacuum chamber to react with gases which would otherwise react with the hydride used in the process (col. 2 line 31-col. 3 line 55). The interior surface of the vacuum chamber is a different location than the impregnated foam occupies in the furnace. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a metal hydride gettering agent as taught by Eber et al. in the process of Johnson et al. in view of Haack et al. and MacGregor since Eber et al. teaches that it will react with undesirable gases which would otherwise react with the hydride used in the article.

With respect to claims 9 and 26, Eber et al. discloses that suitable hydrides include titanium and tantalum (col. 6 lines 28-40), which contain two of the same metals disclosed by

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Johnson et al. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use titanium hydride as taught by Eber et al. with titanium metal as taught by Johnson et al. since Eber et al. teaches equal utility for hydrides of Zr, Ti, Ta, Nb, V and Th. Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use tantalum hydride as taught by Eber et al. with tantalum metal as taught by Johnson et al. since Eber et al. teaches equal utility for hydrides of Zr, Ti, Ta, Nb, V and Th.

With respect to claims 12 and 29, Haack et al. teaches that suitable binders include methylcellulose (col. 3 lines 48-55).

With respect to claims 13 and 30, Haack et al. discloses an example using stainless steel powders of -325 mesh (col. 6 lines 10-29) (i.e. less than 45 microns). The range of less than 45 microns overlaps the claimed range of average 5-100 μm , therefore a prima facie case of obviousness exists. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an mean powder size of 4-45 microns, since Haack et al. discloses equal utility for any size less than 45 microns. With respect to claims 15 and 32, Eber et al. discloses an example pressure of 1.25×10^{-5} mm Hg (i.e. about 1.66×10^{-5} mbars) (col. 6 lines 66-75) which is within the claimed range of 10^{-6} to 10^{-4} mbars.

With respect to claims 16 and 33, Johnson et al. discloses that the pyrolyzing temperature is in the range of 200 to about 600 °C (col. 5 lines 40-41) which overlaps the claimed range of 150 to 550 °C. It would have been obvious to one of ordinary skill in the art at the time the invention was made to pyrolyze at a temperature of between 200 and 550 °C, since Johnson et al. discloses that most organics pyrolyze at between 200 to about 600 °C.

Claims 17 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (U.S. Pat. No. 6,296,667) in view of Haack et al. (U.S. Pat. No. 6,706,239), MacGregor

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(U.S. Pat. No. 4,355,426) and Eber et al. (U.S. Pat. No. 2,686,958) as applied to claims 1-3 and further in view of WO 97/31738 (WO '738).

Johnson et al. in view of Haack et al., MacGregor and Eber et al. is applied as discussed above regarding claims 1-3.

Johnson et al. in view of Haack et al., MacGregor and Eber et al. does not disclose sintering at 1050-1350 °C.

WO '738' discloses a method for preparing a porous metal body by coating a reticulated interconnected web precursor with a slurry containing binder and metal (p. 5 lines 25-35). The precursor is an organic material which is burned off and the resulting metal decarburized and sintered in a partial pressure atmosphere or reactive gas (i.e. pyrolysis; abstract). The formed produces are suitable for biomaterial applications (p. 20 lines 6-12). In Example 5, WO '738 discloses impregnation with titanium powder and binder slurry wherein the selected foam is impregnated with the titanium slurry, then cured (i.e. dried) at 250 to 350 °F then heated in a vacuum to decarburize (i.e. pyrolyzed) followed by sintering at 2200-2700 °F (p. 14 line 15 – p. 16 line 16) (i.e. about 1204 – 1482 °C). It would have been obvious to one of ordinary skill in the art at the time the invention was made to sinter between 1204 – 1482 °C as taught by WO '738 the titanium articles produced by Johnson et al. in view of Haack et al., MacGregor and Eber et al. since WO '738 discloses production of similar articles of the same material by a substantially similar process. Further, the range of 1204 – 1482 °C overlaps the claimed range of 1050-1350 °C therefore a prima facie case of obviousness exists. It would have been obvious to one of ordinary skill in the art at the time the invention was made to sinter Ti articles at between 1204 – 1350 °C since WO '738 discloses equal utility over the range of 1204 – 1482 °C.

Response to Arguments

Applicant's arguments with respect to claims 1-5, 7 and 8 have been considered but are moot in view of the new ground(s) of rejection.

Arguments regarding the restriction are addressed above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen A. McNelis whose telephone number is 571 272 3554. The examiner can normally be reached on M-F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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